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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,643	10/20/2003	Tetsuya Mino	100186-00020	8971

7590 11/29/2006

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EXAMINER

KIM, PAUL D

ART UNIT PAPER NUMBER

3729

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/687,643

Applicant(s)

MINO, TETSUYA

Examiner

Paul D. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/2/2006 has been entered.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al. (US PAT. 5,452,164) in view of Katz (US APT. 4,458,279).

Cole et al. teach a process of making a thin film magnetic head including an inductive recording head part (52a) formed on a magnetoresistive effect reproducing head part (66,68,70,72,74, as shown in Fig. 6) comprising process of: sequentially depositing a first magnetic layer (84), a non-magnetic layer (G) and a second magnetic layer (82) as shown in Figs. 7B-10; and forming a three-layer pole tip structure located between an air bearing surface and a position at a predetermined height from the air bearing surface by dry etching with ion milling (col. 10, lines 26-32) the first magnetic

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layer, the non-magnetic layer and the second magnetic layer at the same time as shown in Fig. 17 (col. 8, line 59 to col. 10, line 32). In addition to the Cole et al. teach an etching process by using any dry etching process such as reactive ion milling etching as well as ion beam milling (which is not the reactive ion milling disclosed in col. 10, lines 26-32).

However, Cole et al. fail to teach a material used for the non-magnetic layer, which having an etching rate equal or higher than the magnetic layers. According to the phrase of col. 9, lines 46-48, the width of the resist layer as shown in Fig. 13 is the width of the track width of the write head (or the inductive recording head part). In addition, according to the phrase of col. 10, lines 9-18 with FIG. 16, the ion milling also forms first and second sidewalls for the first magnetic layer (PT1b) and the second magnetic layer (PT2b) and the non-magnetic layer (G), the first sidewalls of the elements and the non-magnetic layer lying in the first common plane (96) and the second sidewalls of the elements and the non-magnetic layer lying in the second common plane (98). The first and second common planes 96 and 98 are spaced a distance (w) from one another in a parallel relationship to define the track width of the write head. Therefore, the distance (w) after the ion milling process is the same with the first and second magnetic layers and the non-magnetic layer. Even though Cole et al. do not disclose whether the etching rate of the non-magnetic layer is equal to or higher than the first and second magnetic layers, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the non-magnetic layer of Cole et al. with a non-magnetic layer having an etching rate at

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least equal or higher than first and second magnetic layers in order to have a desired track width of pole pieces.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al. in view of Katz (US APT. 4,458,279).

Cole et al. teach all of the limitations as set forth above except a material used for the non-magnetic layer. Katz teaches a process of making a thin film magnetic head having a first pole piece (12, a first magnetic layer) and a second pole piece (26, a second magnetic layer) separated by an insulating layer made of silicon dioxide (as per claim 2, col. 2, lines 48-51) in order to have a desired pattern of the pole pieces.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a non-magnetic layer of Cole et al. by an insulating layer made of silicon dioxide as taught by Katz in order to have a desired pattern of the pole pieces.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al. in view of Rottmayer (US APT. 5,446,613).

Cole et al. teach all of the limitations as set forth above except a material used for the first and second magnetic layers. Rottmayer teaches a process of making a write head element including a first and second pole layers (a first and second magnetic layers) made of nitride containing iron (FeN) in order to have high permeability (col. 3, lines 13-15). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the first and second magnetic layers of Cole et al. by a first and second pole layers (a first and second magnetic layers)

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made of nitride containing iron (FeN) as taught by Rottmayer in order to have high permeability.

### ***Allowable Subject Matter***

5. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to disclose the claimed invention such as forming an inductive recording head part having a non-magnetic layer made of tantalum pentoxide formed in between a first and second magnetic layers made of nickel iron (FeN). It is not obvious taken alone or in combination of other references fairly to suggest the claimed invention.

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1-4 have been considered but are moot in view of the new ground of rejection.

8. Applicant argues that the prior art of record fails to teach the claimed invention such as the non-magnetic layer having an etching rate equal or higher than the magnetic layers. Examiner traverses the argument. When the three-layer pole tip structure formed by dry etching with ion milling of Cole et al., the track width of the three-layer pole tip structure are the same. According to the phrase of col. 9, lines 46-48

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of Cole et al., the first and second common planes are spaced a distance (w) from one another in a **parallel relationship** to define the track width of the write head. The non-magnetic layer having an etching rate lower than the magnetic layers of the prior art of record (Kronubi et al.) indicated by the applicant is needed to be etched by predetermined angles prior to ion milling process to form the desired track width.

Therefore, the prior art of record required several different etching processes to the non-magnetic layer and the magnetic layers in order to have a desired track width. However, Cole et al. do not indicate several different etching the ion milling processes to form the track width is required several different etching processes. Therefore, it would be obvious at the time the invention was made to a person having ordinary skill in the art to use the non-magnetic layer having an etching rate at least equal or higher than the first and second magnetic layers in order to have a desired track width.

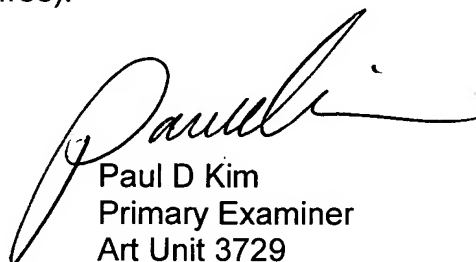
### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul D. Kim whose telephone number is 571-272-4565. The examiner can normally be reached on Monday-Thursday between 6:00 AM to 2:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Paul D Kim  
Primary Examiner  
Art Unit 3729